AL.2.2010-103

University of Alberta Library
0 1620 3452449 4

...dent and teacher: Use this cover sheet for mailing or faxing.

ASSIGNMENT BOOKLET
Mathematics 8
Unit 4 Assignment

FOR STUDENT USE ONLY	
Date Assignment Submitted: _____	(If label is missing or incorrect) Student File Number: _____
Time Spent on Assignment: _____	Module Number: _____

FOR OFFICE USE ONLY
Assigned Teacher: _____
Assignment Grading: _____
Graded by: _____
Date Assignment Received:

Student's Questions and Comments

Apply Module Label Here

Name
Address
Postal Code

Please verify that preprinted label is for correct course and module.

Teacher's Comments

_____
Teacher

INSTRUCTIONS FOR SUBMITTING THIS DISTRIBUTED LEARNING ASSIGNMENT BOOKLET

When you are registered for distributed learning courses, you are expected to regularly submit completed assignments for correction. Try to submit each Assignment Booklet as soon as you complete it. Do not submit more than one Assignment Booklet in one subject at the same time. Before submitting your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

MAILING

1. Do **not** enclose letters with your Assignment Booklets. **Send all letters in a separate envelope.**

2. Put your Assignment Booklet in an envelope and take it to the post office and have it weighed. Attach **sufficient postage** and seal the envelope.

FAXING

1. Assignment Booklets may be faxed to the school with which you are registered. Contact your teacher for the appropriate fax number.

2. All faxing costs are the responsibility of the sender.

E-MAILING

It may be possible to e-mail your completed Assignment Booklet to the school with which you are registered. You also may be **required** to e-mail some of your assignments. Contact your teacher for the appropriate e-mail address.

Mathematics 8

Learn EveryWare

Unit 4

Polygons, Prisms, and Cylinders

Assignment Booklet

we encourage

Alberta Education

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Lesson 1	21	
Lesson 2	21	
Lesson 3	21	
Lesson 4	13	
Lesson 5	14	
Lesson 6	12	
Lesson 7	19	
Lesson 8	22	
	143	

Teacher's Comments

Mathematics 8
Unit 4: Polygons, Prisms, and Cylinders
Assignment Booklet
ISBN 978-0-7741-3142-1

Cover Art: © Ilja Mašík/shutterstock

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	

You may find the following Internet sites useful:

- Alberta Education, **http://www.education.gov.ab.ca**
- Learning Resources Centre, **http://www.lrc.education.gov.ab.ca**
- Tools4Teachers, **http://www.tools4teachers.ca**

Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

Copyright © 2009, Alberta Education. This resource is owned by the Crown in Right of Alberta, as represented by the Minister of Education, Alberta Education, 10155 – 102 Street, Edmonton, Alberta, Canada T5J 4L5. All rights reserved.

This courseware was developed by or for Alberta Education. Third-party content has been identified by a © symbol and/or a credit to the source and must be used as is. This courseware may be reproduced in any form, including photocopying, without the written permission of Alberta Education. Changes can be made only to content owned by Alberta Education. For more detailed information, refer to the Terms of Use Agreement. Every effort has been made to acknowledge the original source and to comply with Canadian copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Education so corrective action can be taken.

THIS COURSEWARE IS NOT SUBJECT TO THE TERMS OF A LICENCE FROM A COLLECTIVE OR LICENSING BODY, SUCH AS ACCESS COPYRIGHT.

UNIVERSITY LIBRARY
UNIVERSITY OF ALBERTA

UNIT 4 ASSIGNMENT BOOKLET

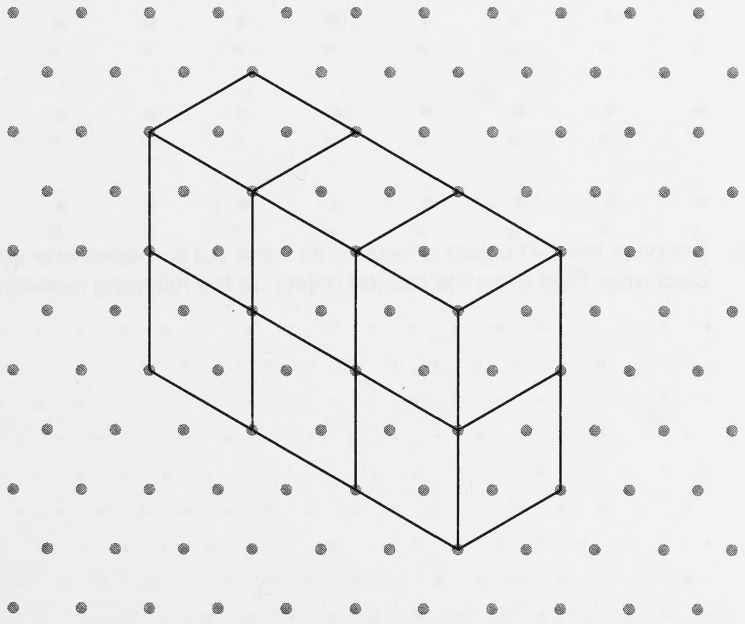
The value of each assignment and each question is stated in the left margin. You may write your answers to the questions in this assignment booklet, if there is enough space for your answer. Or you may record your answers on your own paper and attach your finished work to the assignment booklet.

Unit 4: Lesson 1 Question Set

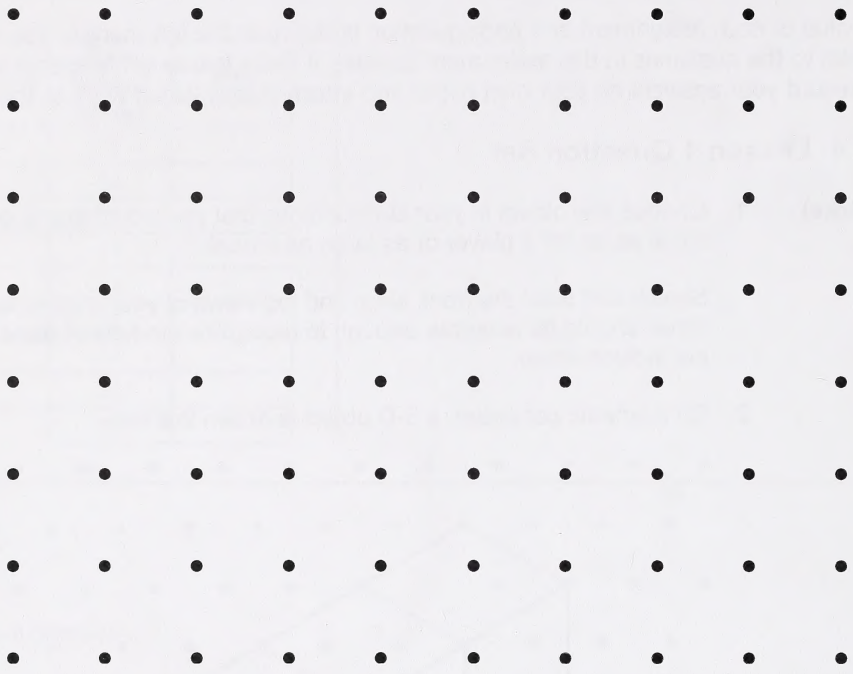
(6 marks) 1. Choose any object in your surroundings that you would like to draw. It could be as small as an MP3 player or as large as a truck.

Sketch and label the front, side, and top views of your chosen object. Your sketched views should be accurate enough to recognize the type of object depicted but need not include detail.

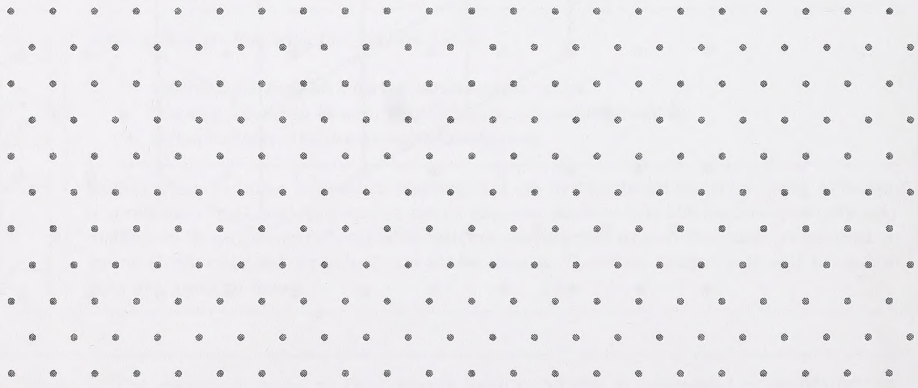
2. On isometric dot paper, a 3-D object is drawn this way.



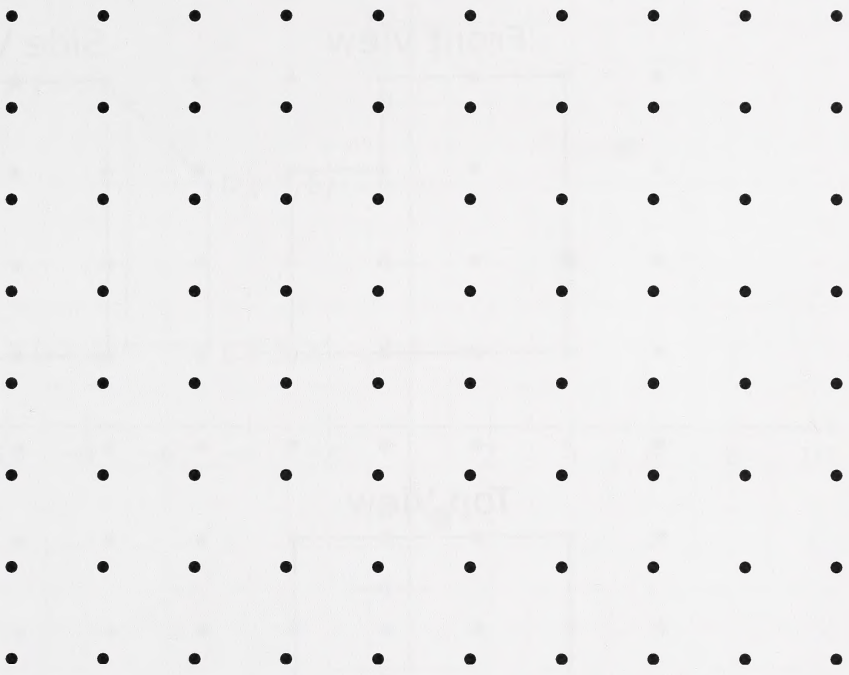
a. Draw the top, side, and front views of the 3-D object.



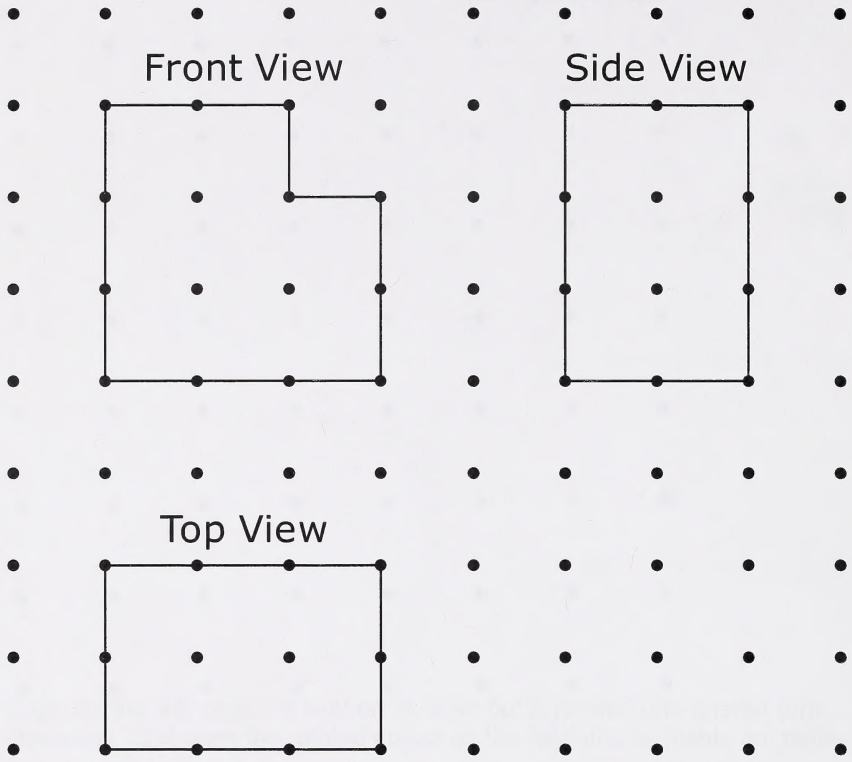
b. Suppose the 3-D object is kept on its base but is rotated one-quarter turn clockwise. First draw the rotated object on the following isometric dot pattern.



Then draw the top, side, and front views of the rotated 3-D object on the following square dot pattern.



(5 marks) 3. These views are of an object made of 16 unit blocks.



Make a drawing of the 3-D object on the isometric dot pattern to show what the object looks like.

4. Look at Figure ABCD drawn on the coordinate grid.

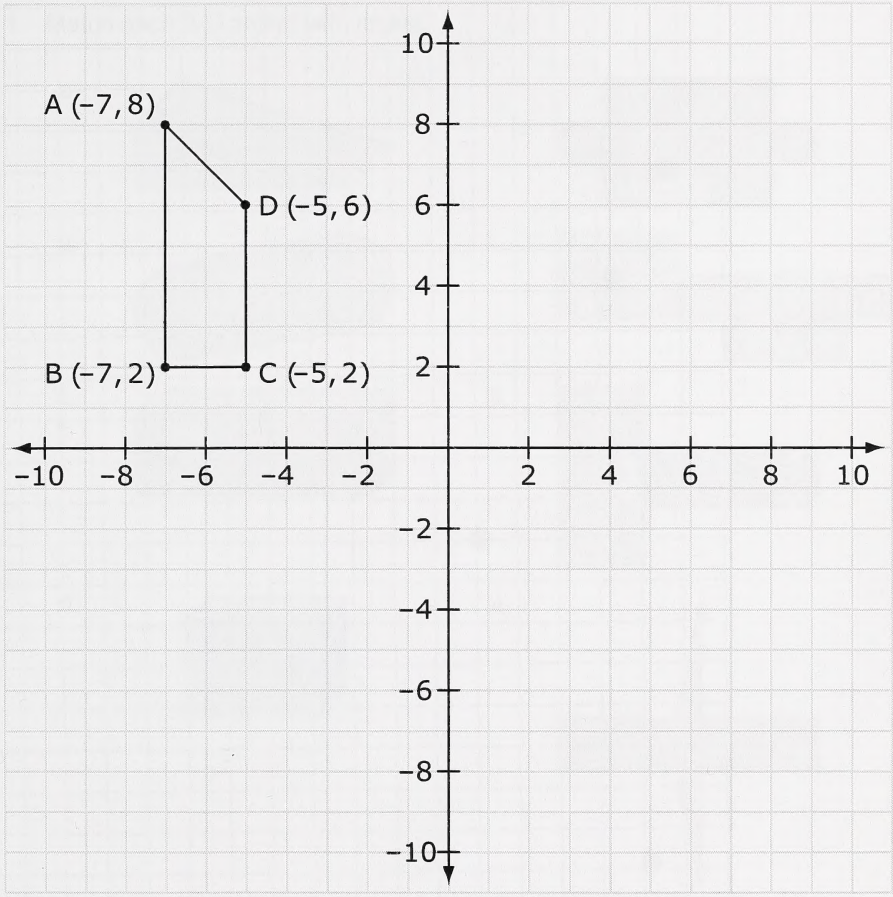


Figure ABCD is to be transformed by a reflection. The mirror line for the reflection is the *y*-axis (the vertical axis).

(2 marks) a. List the vertices of the reflected image and their coordinates.

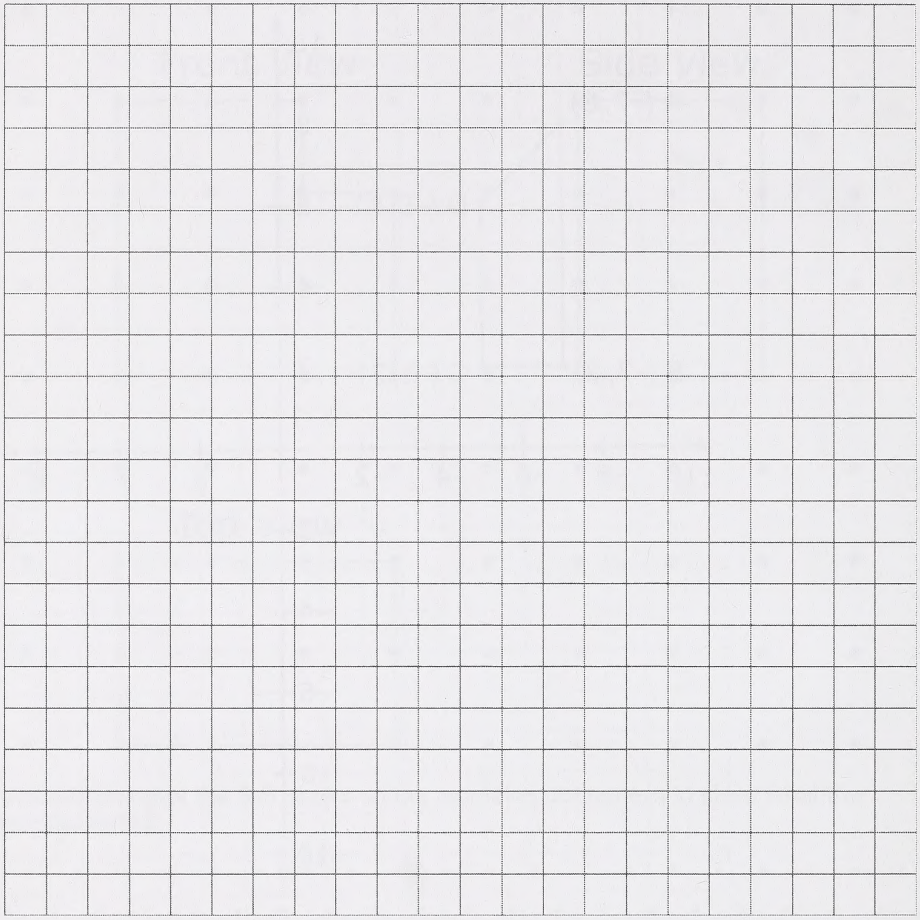
_____

_____

_____

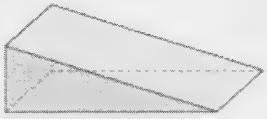
_____

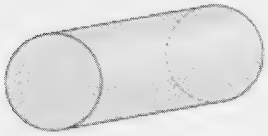
(2 marks) b. Draw the reflected image and its vertices on the coordinate grid.

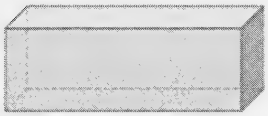


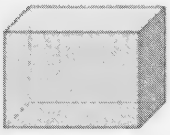
Unit 4: Lesson 2 Question Set

(4 marks) 1. Match each 3-D object with its net.

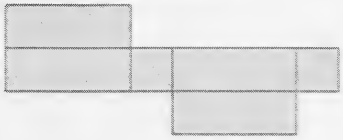
a. 

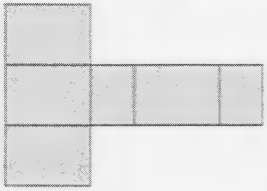
b. 

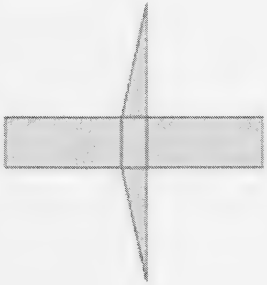
c. 

d. 

i.

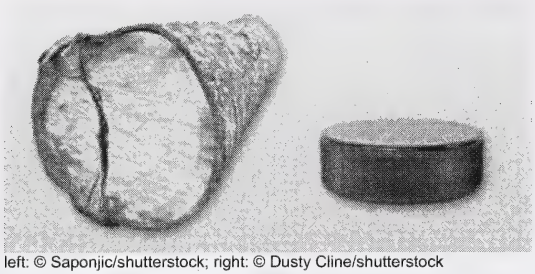
ii. 

iii. 

iv. 

MathLinks 8: Solutions CD (Toronto: McGraw-Hill Ryerson, 2008) 174. Reproduced by permission.

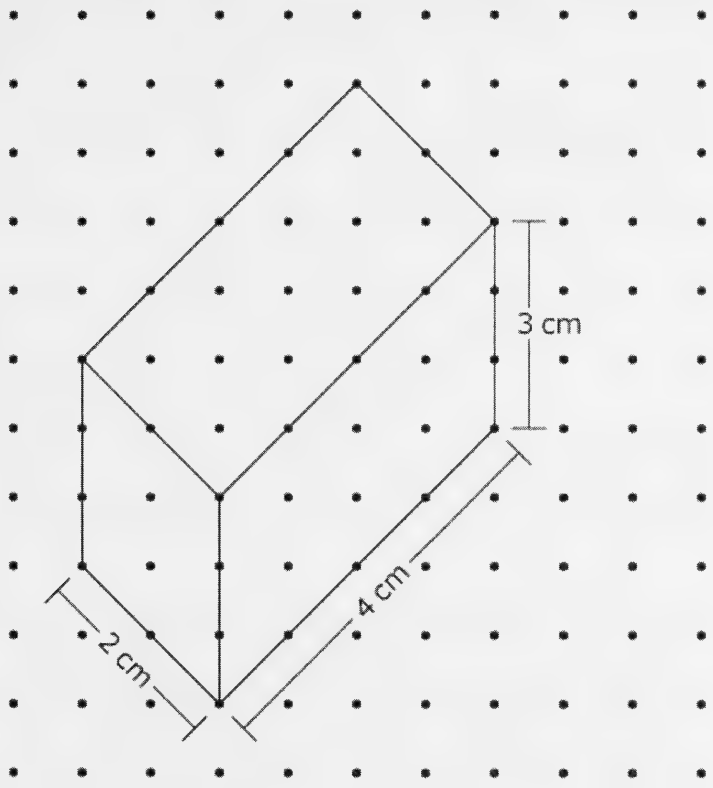
(6 marks) 2. Think of the objects in the following photograph as cylinders.



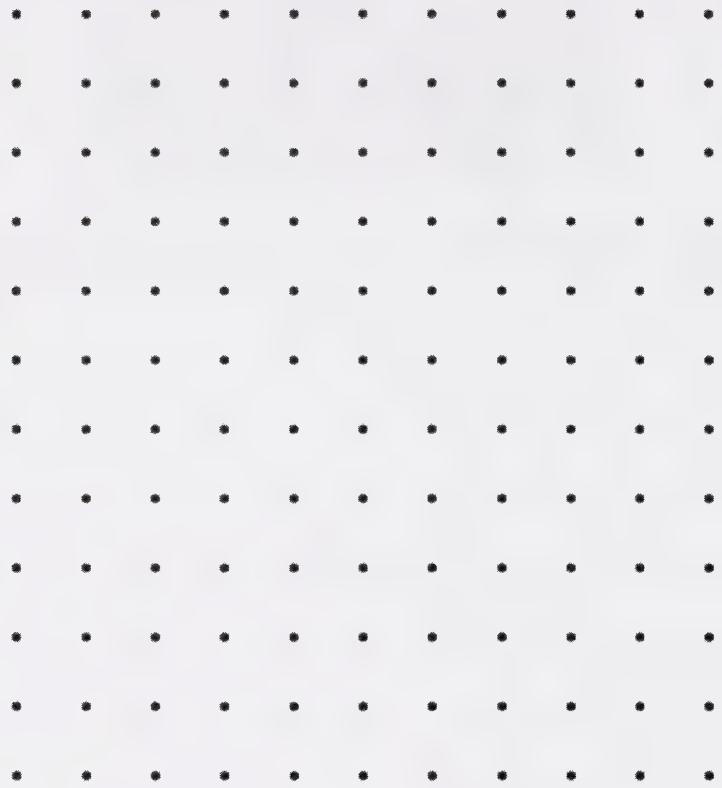
left: © Saponjic/shutterstock; right: © Dusty Cline/shutterstock

Create nets for both of these objects. Make the nets so that the differences in the 3-D objects are shown in the nets. The nets do not have to be drawn to the same scale. Then give reasons for the differences you made between the two nets.

(6 marks) 3. A student made the following drawing on isometric dot paper for a right rectangular prism.



On square dot paper, sketch a net for the object. Place the measurements from the prism on the net. You may print a copy of this page and draw your sketch on the square dot paper below. Or you may return to the lesson and click on "Square Dot Paper" to complete this question.

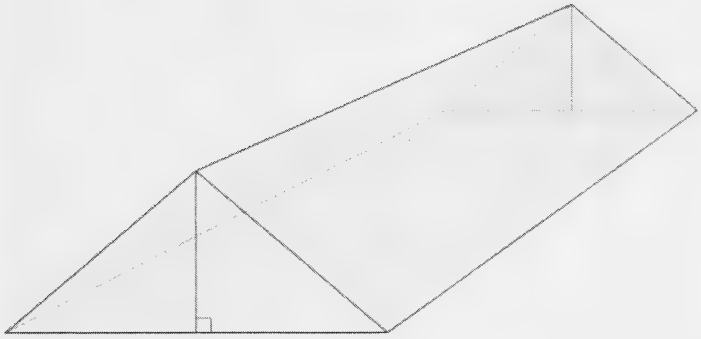


(4 marks) 4. Container ships carry all cargo in shipping containers rather than directly in the hull. Standard shipping containers are over 6 m long. They measure 6.1 m long by 2.4 m wide by 2.6 m high.

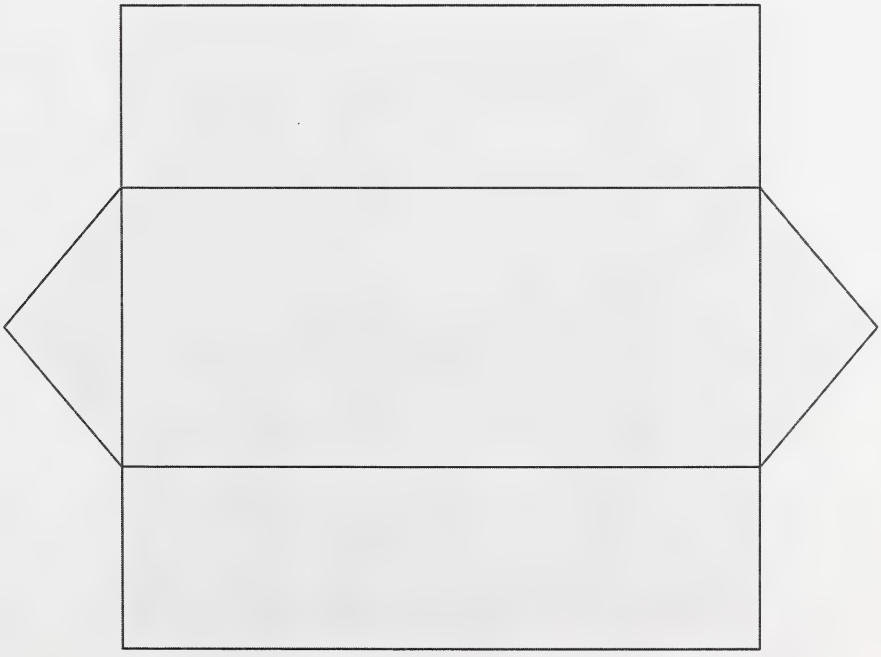
Sketch a net for the standard shipping container. Include measurement. You do not have to draw the net exactly to scale. You can use your own paper to sketch a net. Then attach your finished work to the Unit 4: Lesson 2 Question Set.

Unit 4: Lesson 3 Question Set

(4 marks) 1. A builder has decided to build a glass greenhouse in the shape of a right rectangular prism. All the walls will be made of glass. The floor will be constructed from wooden-decking material.



In calculating the area of glass needed, the builder made a net for a right rectangular prism. The net looked like this.



Indicate which face areas must be used to calculate the area of glass needed to construct the greenhouse. Give reasons for your answer. Use a diagram to explain you answer.

(8 marks) 2. Crackers come in a right rectangular prism-shaped box.

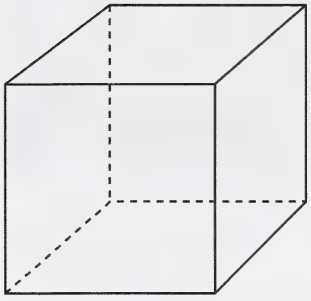
A student measured the dimensions of the box to be as follows:

Determine the surface area of the box based on the student's measurements. Show all of your steps as you carry out your calculations.

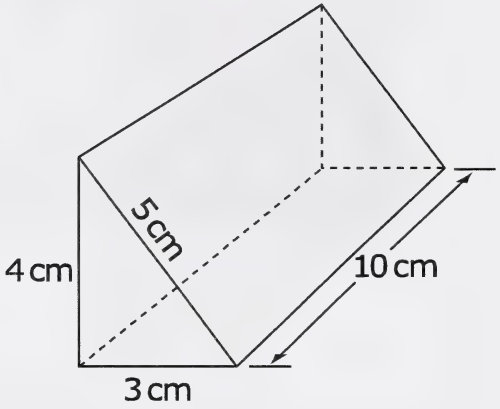
(8 marks) 3. A breath-mints manufacturer was deciding whether to use a rectangular-prism or a triangular-prism shape for the packaging of a new breath-mint product.

The manufacturer was given two sketches by a package designer.

Cube



Triangular Prism



The package designer explained that each shape would be able to hold the same number of mints. But each shape has a unique advantage. The triangular prism would catch shoppers' attention, and the cube or rectangular shape would stack more easily on store shelves.

The manufacturer decided to select the shape that used the least amount of cardboard. Using this as the deciding factor, which shape should the manufacturer use—the cube or the right triangular prism? Show the calculations you used to come to a conclusion.

Unit 4: Lesson 4 Question Set

(4 marks) 1. Paper towel is often sold in rolls. A rigid cardboard tube is at the centre of the roll, which allows the roll to rotate freely on a pin-shaped holder.

© Shapiro Svetlana/shutterstock

The tube is shaped like a cylinder. To calculate the cardboard used to make the tube, a student sketched a complete net for its shape as a cylinder.

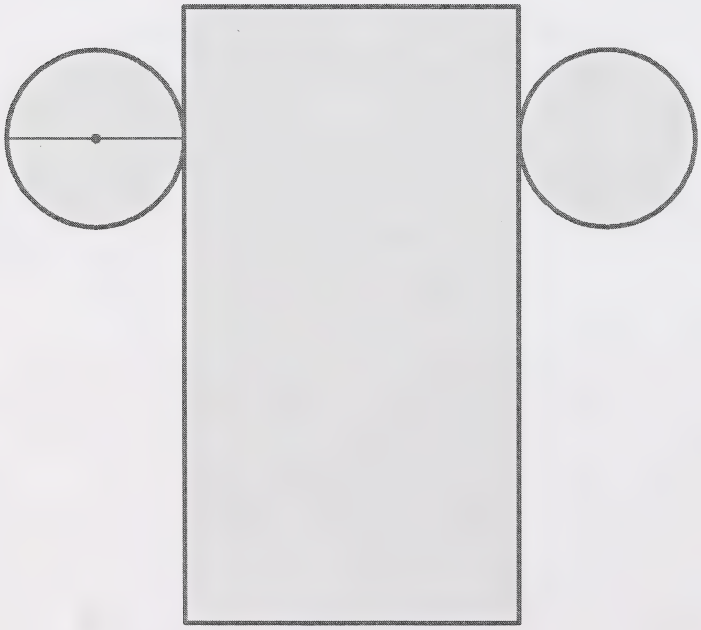
If you have a roll of paper towel in your home, you may find it helpful to remove the centre cylinder and cut it open with a pair of scissors so you can see the net yourself. (Make sure to get permission from your parent or guardian first.) Or you may find a used centre roll in your cardboard recycling.

Indicate the shape or shapes of the net that represent the cardboard that is used to make the tube and those that do not represent cardboard. How do you know you are correct? What would make you believe this?

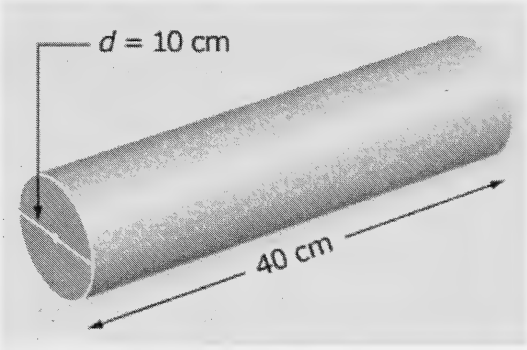
(3 marks) 2. After trying various strategies to find a formula for the surface area of cylinders, a student found that that she preferred using the following formula:

$SA = 2 \times (\pi \times r^2) + (\pi \times d \times h)$

Within the formula are the expressions $(\pi \times r^2)$ and $(\pi \times d \times h)$. Create a line drawing of a net and on each shape of the net, write the expression that would calculate its area.



(6 marks) 3. Calculate the surface area for this cylinder.



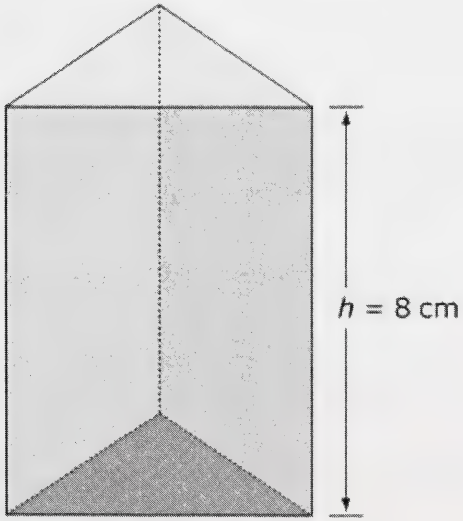
Show your work. Express your answer to the nearest whole square centimetre. Use a strategy of your own choice.

Unit 4: Lesson 5 Question Set

(4 marks) 1. On page 246 of the textbook, you read about Bruce. He was working for a shipping company loading shipping containers with cube-shaped boxes all the same size. He found that 48 boxes fit on the bottom layer. As he piled boxes up at the far end of the shipping container, he found he could go up five boxes high. Calculate how many boxes will fit inside the container. Show how you determined the number of boxes.

(3 marks) 2. A candy manufacturer designed a container to look like this right triangular prism for a new breath-mint product.

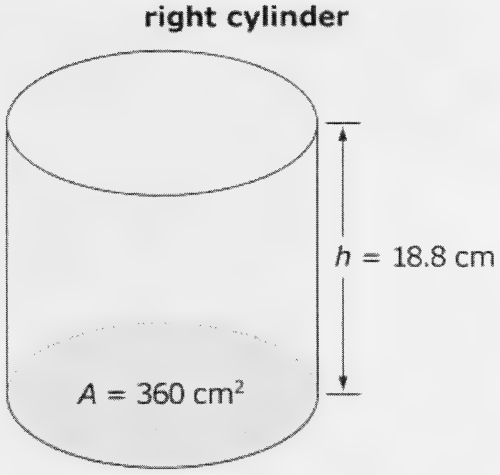
right triangular prism



$A = 24 \text{ cm}^2$

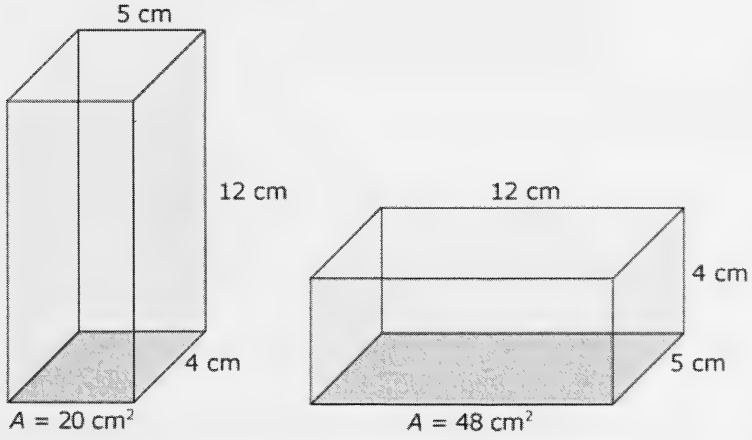
Determine the volume of the right triangular prism. Show your work.

(3 marks) 3. The following right cylinder was used in the design of a plastic bucket.



Determine the volume of the right cylinder. Show your work.

(4 marks) 4. Antonio and Tina looked at the following right rectangular prisms.



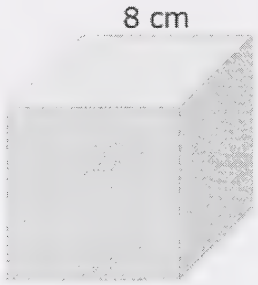
They determined that the volume of the prism on the left was 240 cm^3. Without any more calculation, Tina stated to Antonio that the volume of the other prism was also 240 cm^3.

(1 mark) a. How could Tina recognize that the volume of the other prism was equal to 240 cm^3 without performing any calculations?

(3 marks) b. Verify if Tina's statement was correct by calculating the volume of the prism on the right. Show your calculation.

Unit 4: Lesson 6 Question Set

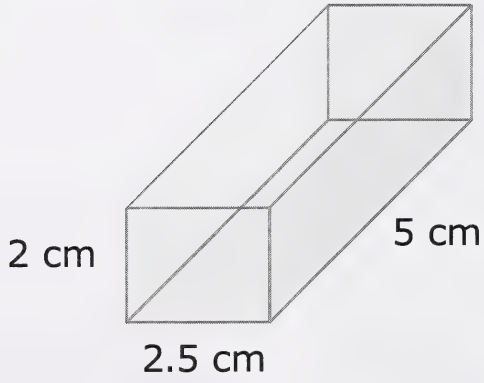
(3 marks) 1. A manufacturer designed a cube-shaped box to hold a new baseball and a little packing material around the ball. The design of the box looked like this:



(1 mark) a. What formula could be used to find the volume of the box?

(2 marks) b. Determine the volume of the box. Show your calculations.

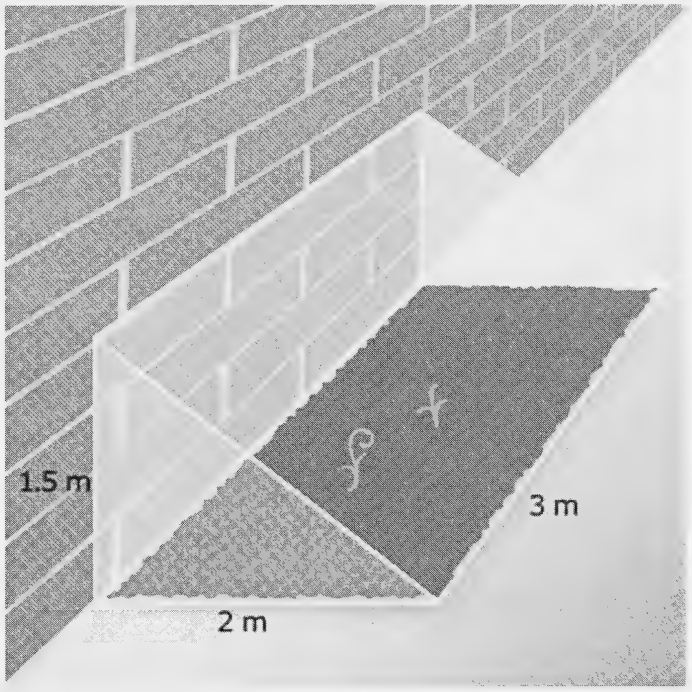
(3 marks) 2. A small glass box in the shape of the right rectangular prism was used to store a small oval broach. The box had the shape and dimensions of this right rectangular prism:



(1 mark) a. What formula could be used to find the volume of the box?

(2 marks) b. Determine the volume of the box. Show your calculations.

(6 marks) 3. A gardener built a simple greenhouse against the side of a house. The greenhouse had the following dimensions and looked like this:



What do you notice about the shape of the greenhouse? The greenhouse is shaped just like a triangular prism.

(1 mark) a. What formula could be used to find the volume of the greenhouse?

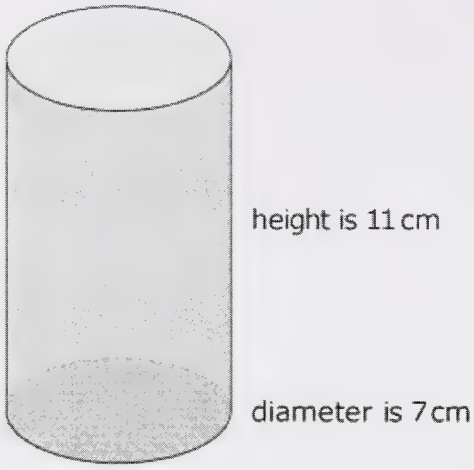
(2 marks) b. What are the length of the base and the height of the triangle of the prism-shaped greenhouse?

(1 mark) c. Looking at the greenhouse as a triangular prism, what is the height of the greenhouse?

(2 marks) d. Determine the volume of the greenhouse. Show your calculations.

Unit 4: Lesson 7 Question Set

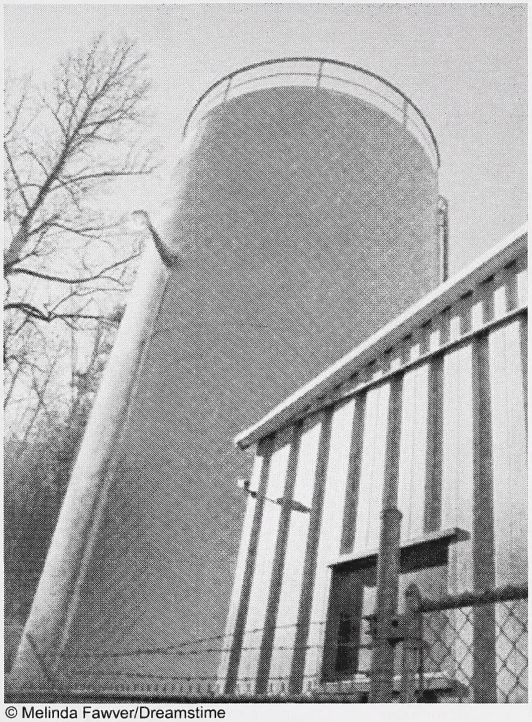
(5 marks) 1. A cylinder has a height of 11 cm and a diameter of 7 cm.



What is the volume of the cylinder? Show your work, and round your answer to the nearest whole number of cubic centimetres.

(4 marks) 2. The radius of a cylinder is 12 mm and its height is 25 mm. Determine the volume of the cylinder. Show your work, and round your answer to the nearest whole number. Include the correct unit.

(10 marks) 3. A community of 1000 people store water in a cylindrical storage tank. The tank, as described in the Get Focused, has a height of 21.6 m and a diameter of 10.5 m.[1]



© Melinda Fawver/Dreamstime

The tank is completely full. On average, each resident uses 604 L of water every day.[1]

(6 marks) a. Determine the volume of water in the tank. Show your calculations.

(4 marks) b. Determine how long this water would last in the town if each of the residents continues to use water at the rate of 604 L per day. State your answer to the nearest day. Note that 1 m^3 equals 1000 L.

[1] Adapted from Bruce McAskill et al., *MathLinks 8: Student Resource* (Toronto: McGraw-Hill Ryerson, 2008), 267. Reproduced by permission.

Unit 4: Lesson 8 Question Set

(8 marks) 1. The $2 coin, known as a toonie, is made of a mainly copper core and has an outer ring of nickel. The toonie has a thickness of 1.8 mm, and the diameter is 28 mm. Its core has a diameter of 17 mm.

© 2009 Jupiterimages Corporation

Determine the volume of nickel in the outer ring of the toonie to the nearest cubic millimetre.

(6 marks) 2. A cylinder having a radius of 4 cm and a height of 12 cm is to be replaced by a second cylinder having the same volume. The second cylinder is to have a radius of 6 cm. Determine how high the second cylinder is to be made. Give your answer to the nearest tenth of a centimetre.

(8 marks) 3. A shipping crate has a base measuring 160 cm by 200 cm. The height of the crate is 110 cm. The crate is to hold 1000 boxes each measuring 20 cm by 16 cm by 10 cm. Each layer is to be made up of an identical arrangement of boxes.

(3 marks) a. Sketch a diagram to show how the boxes should be arranged in each layer so that all 1000 boxes will fit into the crate. Indicate the number of boxes that fit along each side of the base of the crate.

(1 mark) b. How many boxes fit on each layer?

(2 marks) c. Indicate how many layers of boxes you will need to place in the crate. Show your calculation.

(2 marks) d. What distance will there be between the top layer of boxes and the ceiling of the crate?